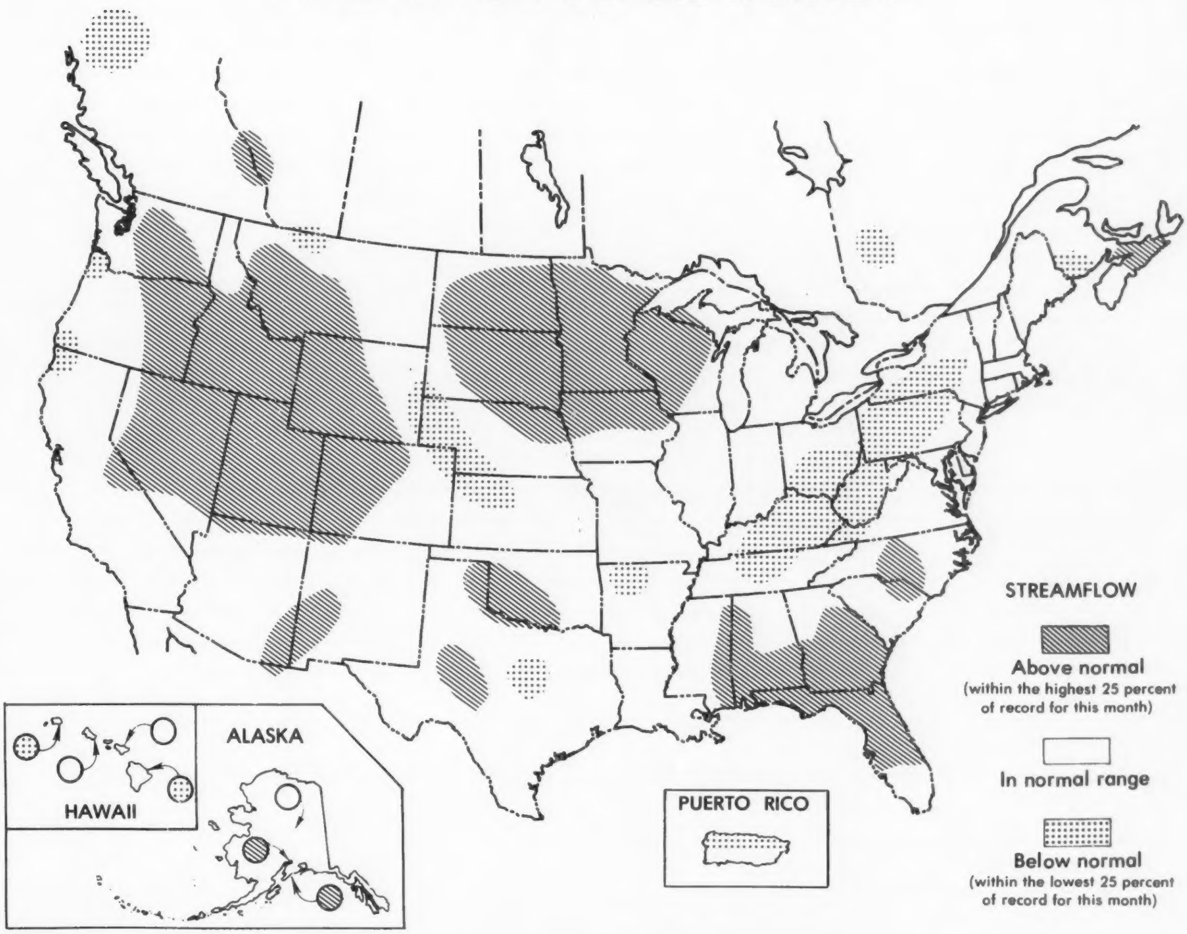
# National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

JANUARY 1984

## STREAMFLOW DURING JANUARY




Streamflow remained in the above-normal range in parts of most western, southeastern, and north-central States during January. Flows were in the below-normal range in a large area in and adjacent to West Virginia and in smaller areas in Arkansas, California, Hawaii, Kansas, Nebraska, Montana, Oregon, Puerto Rico, Texas, and southern Canada. Monthly and/or daily mean flows were highest of record for January in parts of Idaho, Montana, North Carolina, and Utah, and lowest of record for the month in parts of Kansas and Puerto Rico.

Minor lowland flooding was reported on numerous rivers and streams in the South Atlantic and Gulf Coast States and the Far West during the month. The elevation of Great Salt Lake in northern Utah rose to 4,206.30 feet above sea level on January 31, 1984, the highest elevation in almost 100 years.

## STREAMFLOW CONDITIONS DURING JANUARY 1984

Streamflow generally decreased in Alaska, Arkansas, Colorado, Louisiana, Nevada, southeastern Canada, and in most States north and east of Missouri in the United States. Monthly mean flows generally increased in Hawaii, Oklahoma, and South Dakota, and in southwestern Canada and adjacent areas of the United States. Flows elsewhere in the United States were variable.

Monthly mean flows remained in the above-normal range in parts of most South Atlantic and Gulf Coast States, all Western States except Washington, and most North Central States. Monthly and/or daily mean flows were highest of record for January in parts of North Carolina, Idaho, Montana, and Utah. (See table on page 3.) The above-normal trend in streamflow continued in Wisconsin where monthly mean flow of Jump River at Sheldon, in the northern part of the State, decreased seasonally to 193 percent of the long-term median flow for January, but remained in the above-normal range for the 5th consecutive month. (See graph on page 3.) By contrast, monthly mean flow of Monongahela River at Braddock, in southwestern Pennsylvania, decreased sharply and was in the below-normal range for the first time since August 1983. Above-normal streamflows have persisted for 18, 19, and 19 consecutive months, respectively, at the index stations, Virgin River at Littlefield, Arizona, Humboldt River at Palisade, Nevada, and Snake River at Weiser, Idaho. In addition, the monthly mean discharge of 33,700 cubic feet per second at Snake River at Weiser (drainage area, 69,200 square miles) was highest for January in 74 years of record.

Flows remained in the below-normal range in parts of British Columbia, Hawaii, Kansas, Montana, Nebraska, Oregon, and Texas, and decreased into that range in parts of Arkansas, California, Maine, New York, Pennsylvania, Virginia, and much of the Ohio River basin. Monthly mean flow was lowest of record for the 6th consecutive month at an index station in western Kansas. (See table on page 3.) In New York, monthly mean flow of Mohawk River at Cohoes decreased sharply to only 68 percent of median during January as a result of abnormally cold weather.

In Idaho, moderating temperatures near month end resulted in the formation of large ice jams on the Salmon and St. Joe Rivers, and parts of Salmon and Calder were damaged and people were left homeless by the ice jams and associated flooding. Similarly, an ice jam nearly 500 miles in length formed in the Missouri River above Jefferson City, Missouri, and caused lowland flooding. Flood stages, as designated by the National Weather Service, were exceeded on numerous rivers and streams in the South Atlantic and Gulf Coast States and in the Far West during January, resulting in minor lowland flooding.

In Utah, streamflows at the seven index stations averaged 188 percent of the long-term median flow for January. In the northern part of the State, the elevation of Great Salt Lake rose to 4,206.30 feet above sea level on January 31, 1984, 4.20 feet higher than last year, and the highest elevation in almost 100 years.

Near- or above-average contents continued to characterize most reservoirs in the United States during January. Contents of several reservoirs in the Northeast and in parts of Texas were below average, however, including the New York City reservoir system which was 16 percent below the long-term average for January.

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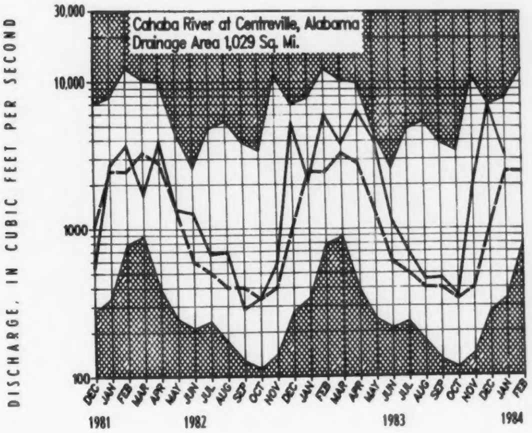
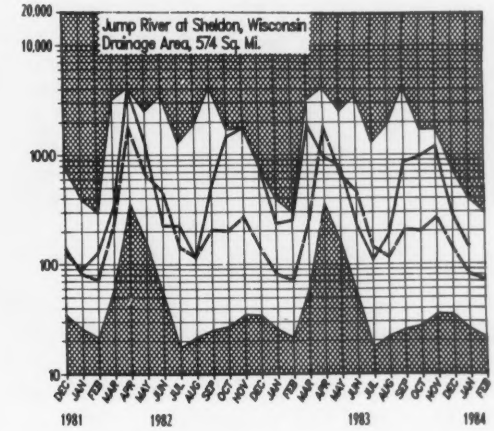
### CONTENTS

## SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median for monthly values for reference period, 1951–80. Heavy line indicates mean for current period.




## *NEW EXTREMES DURING JANUARY 1984 AT STREAMFLOW INDEX STATIONS*

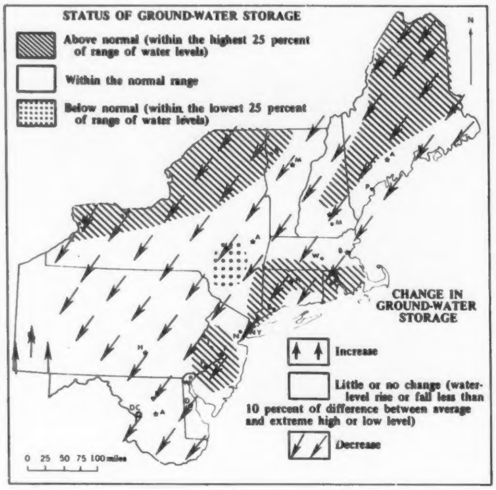
| Station number | Stream and place of determination | Drainage area (square miles) | Years of record | Previous January extremes (period of record) | | January 1984 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Monthly mean in cfs (year) | Daily mean in cfs (year) | Monthly mean in cfs | Percent of median | Daily mean in cfs | Day |
| | **HIGH FLOWS** | | | | | | | | |
| 02102000 | Deep River at Moncure, North Carolina. | 1,410 | 54 | 7,182 (1978) | 21,800 (1954) | 4,502 | 195 | 23,500 | 11 |
| 06191500 | Yellowstone River at Corwin Springs, Montana. | 2,623 | 78 | 1,214 (1912) | 1,530 (1912) | 1,260 | 158 | 1,420 | 4,5 |
| 06214500 | Yellowstone River at Billings, Montana. | 11,795 | 56 | 3,548 (1976) | 7,780 (1974) | 3,740 | 149 | 5,430 | 8,9 |
| 09180500 | Colorado River near Cisco, Utah . . | 24,100 | 73 | 5,399 (1971) | 6,550 (1969) | 6,280 | 205 | 6,800 | 26 |
| 09315000 | Green River at Green River, Utah. . | 40,600 | 85 | 4,883 (1965) | 7,150 (1965) | 5,040 | 201 | 5,650 | 24 |
| 10128500 | Weber River near Oakley, Utah . . . | 163 | 80 | 86.2 (1914) | 114 (1914) | 94.0 | 183 | 111 | 4 |
| 10234500 | Beaver River near Beaver, Utah . . . | 91.0 | 70 | 27 (1942) | 32 (1917) | 28.1 | 186 | 31 | 4 |
| 13037500 | Snake River near Heise, Idaho . . . | 5,752 | 74 | 4,100 (1918) | ..... ..... | 4,200 | 140 | ..... | ... |
| 13269000 | Snake River at Weiser, Idaho . . . . | 69,200 | 74 | 33,210 (1971) | 62,500 (1971) | 33,700 | 205 | ..... | ... |
| | **LOW FLOWS** | | | | | | | | |
| 06867000 | Saline River near Russell, Kansas. | 1,502 | 33 | 2.74 (1979) | 0.72 (1967) | 1.8 | 7 | 1.7 | 20 |
| 50038100 | Rio Grande de Manati at Hwy 2 near Manati, Puerto Rico. | 197 | 13 | 108 (1978) | 89 (1978) | 110 | 48 | 85 | 23 |
| 50112500 | Rio Inabon at Real Abajo, Puerto Rico. | 9.7 | 19 | 4.17 (1974) | 3.1 (1974) | 6.43 | 91 | 2.5 | 22 |

## GROUND-WATER CONDITIONS DURING JANUARY 1984

Ground-water levels declined in most of the region, reversing the rising trend that prevailed during November and December. There were some exceptions, including rising levels or only slight changes in water levels in some wells in January in southeastern Massachusetts, on Long Island, New York, in southern New Jersey, and in western Pennsylvania. Levels near the end of January remained above average in several parts of New England as well as in northern New York State and central New Jersey. Levels were below average in part of southeastern New York in and near the Catskill Mountains.

In the southeastern States, ground-water levels rose in Virginia and North Carolina, and mostly declined in West Virginia; trends were mixed in other States. Water levels were above average in Kentucky, Virginia, and North Carolina, average or above average in Florida, and below average in Arkansas. Levels were above and below average in West Virginia and Louisiana. A new January low occurred in Louisiana.

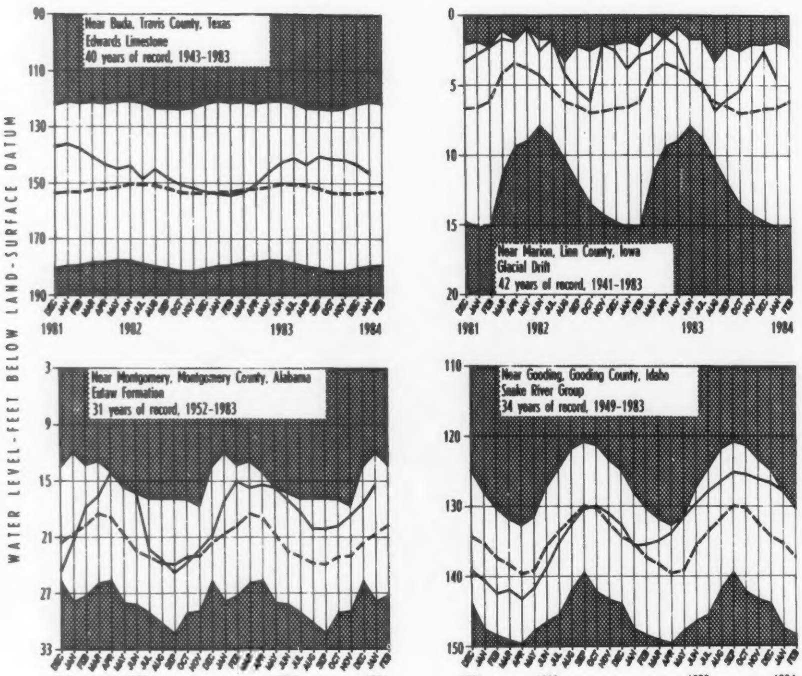
In the central and western Great Lakes States, ground-water levels rose or held steady in Indiana, and declined in Michigan and in most of Minnesota and Iowa. Levels




Map shows ground-water storage near end of January and change in ground-water storage from end of December to end of January.

## MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



## *WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—JANUARY 1984*

| Aquifer and location | Water level in feet with reference to land-surface datum | Departure from average in feet | Net change in water level in feet since: | | Year records began | Remarks |
|---|---|---|---|---|---|---|
| | | | Last month | Last year | | |
| Glacial drift at Hanska, south-central Minnesota | -10.30 | -1.43 | -0.18 | +5.02 | 1943 | |
| Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan | -4.30 | +0.64 | -0.17 | -0.37 | 1935 | |
| Glacial drift at Marion, Iowa | -4.69 | +1.78 | -2.08 | -0.85 | 1941 | |
| Glacial drift at Princeton in northwestern Illinois | -8.38 | +4.70 | -1.88 | -0.88 | 1943 | |
| Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia | -14.45 | +.70 | +2.09 | +.24 | 1939 | |
| Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2) | -18.09 | +7.90 | -0.23 | +0.72 | 1946 | |
| 500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2) | -103.49 | -15.12 | +0.14 | -1.07 | 1941 | |
| Granite in eastern Piedmont Province, Chapel Hill, North Carolina | -40.60 | +2.64 | +1.27 | +1.60 | 1931 | |
| Sparta Sand in Pine Bluff industrial area, Arkansas | -238.20 | -42.66 | ..... | -8.25 | 1958 | |
| Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4) | -15.4 | +5.1 | +2.0 | +1.7 | 1952 | |
| Limestone aquifer on Cockspur Island, Savannah area, Georgia (U.S. well no. 6) | -31.65 | -6.02 | +0.25 | -1.85 | 1956 | |
| Sand and gravel in Puget Trough, Tacoma, Washington | -100.48 | +9.55 | +0.70 | +2.50 | 1952 | |
| Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3) | -456.7 | +4.5 | -0.4 | +2.5 | 1929 | |
| Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho | -124.7 | -6.2 | -2.0 | +1.7 | 1957 | |
| Alluvial valley fill in Flowell area, Millard County, Utah (U.S. well no. 9) | -20.70 | +5.84 | +1.90 | +19.92 | 1929 | |
| Alluvial sand and gravel, Platte River Valley, Ashland, Nebraska (U.S. well no. 6) | -4.86 | +1.07 | +0.68 | -0.96 | 1935 | |
| Alluvial valley fill in Steptoe Valley, Nevada | -9.60 | ..... | +0.33 | +0.67 | 1950 | January high. |
| Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern Kansas | -21.19 | +0.10 | +0.03 | -0.54 | 1953 | |
| Alluvium and Paso Robles, clay, sand, and gravel, Santa Maria Valley, California | -102.57 | +38.77 | +7.81 | +42.69 | 1957 | January high. |
| Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15) | -108.1 | -30.73 | +0.5 | +3.1 | 1951 | |
| Hueco bolson, El Paso area, Texas | -259.72 | -15.75 | +1.01 | -0.82 | 1965 | January low. |
| Evangeline aquifer, Houston area, Texas | -314.37 | -18.77 | -7.02 | +12.57 | 1965 | |

showed mixed trends in Ohio. Water levels were above and below average in Minnesota, Michigan, and Iowa.

In the western States, ground-water levels rose in Washington, Nebraska, Arizona, and New Mexico, and declined in Idaho. Trends were mixed in other western States. Water levels were above average in Washington and Nebraska, and below average in Arizona and New Mexico. Levels were mixed with respect to average in other States. New high ground-water levels for January were recorded in Nebraska, southern California, Nevada, and Utah, and new low levels for January occurred in Arizona, New Mexico, and Texas.

## *USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END JANUARY 1984*

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

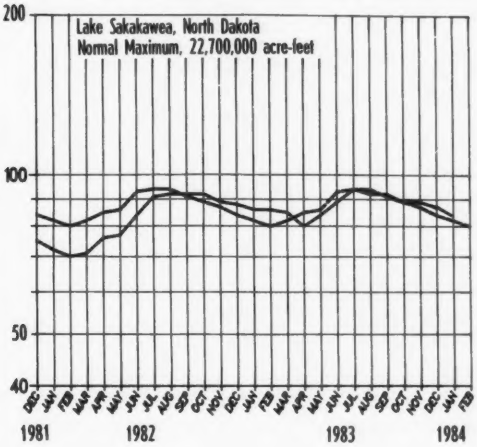
| Reservoir<br>Principal uses:<br>F–Flood control<br>I–Irrigation<br>M–Municipal<br>P–Power<br>R–Recreation<br>W–Industrial | Percent of normal maximum | | | | Normal maximum (acre-feet)[a] |
|---|---|---|---|---|---|
| | End of Jan. 1984 | End of Jan. 1983 | Average for end of Jan. | End of Dec. 1983 | |
| **NOVA SCOTIA** | | | | | |
| Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P) | 44 | 39 | 57 | 38 | [b]226,300 |
| **QUEBEC** | | | | | |
| Allard (P) | 41 | 84 | 46 | 56 | 280,600 |
| Gouin (P) | 64 | 61 | 59 | 70 | 6,954,000 |
| **MAINE** | | | | | |
| Seven reservoir systems (MP) | 64 | 55 | 50 | 78 | 4,098,000 |
| **NEW HAMPSHIRE** | | | | | |
| First Connecticut Lake (P) | 40 | 54 | 36 | 65 | 76,450 |
| Lake Francis (FPR) | 47 | 66 | 51 | 82 | 99,310 |
| Lake Winnipesaukee (PR) | 70 | 75 | 57 | 88 | 165,700 |
| **VERMONT** | | | | | |
| Harriman (P) | 56 | 57 | 46 | 87 | 116,200 |
| Somerset (P) | 42 | 68 | 59 | 86 | 57,390 |
| **MASSACHUSETTS** | | | | | |
| Cobble Mountain and Borden Brook (MP) | 74 | 76 | 70 | 78 | 77,920 |
| **NEW YORK** | | | | | |
| Great Sacandaga Lake (FPR) | 46 | 47 | 45 | 56 | 786,700 |
| Indian Lake (FMP) | 61 | 64 | 53 | 84 | 103,300 |
| New York City reservoir system (MW) | 69 | 56 | ... | 70 | 1,680,000 |
| **NEW JERSEY** | | | | | |
| Wanaque (M) | 98 | 80 | 75 | 101 | 85,100 |
| **PENNSYLVANIA** | | | | | |
| Allegheny (FPR) | 26 | 33 | 29 | 55 | 1,180,000 |
| Pymatuning (FMR) | 83 | 84 | 83 | 81 | 188,000 |
| Raystown Lake (FR) | 66 | 67 | 53 | 68 | 761,900 |
| Lake Wallenpaupack (PR) | 53 | 66 | 52 | 79 | 157,800 |
| **MARYLAND** | | | | | |
| Baltimore municipal system (M) | 96 | 62 | 85 | 95 | 261,900 |
| **NORTH CAROLINA** | | | | | |
| Bridgewater (Lake James) (P) | 88 | 87 | 79 | 96 | 288,800 |
| Narrows (Badin Lake) (P) | 95 | 89 | 96 | 97 | 128,900 |
| High Rock Lake (P) | 52 | 45 | 68 | 71 | 234,800 |
| **SOUTH CAROLINA** | | | | | |
| Lake Murray (P) | 86 | 85 | 65 | 80 | 1,614,000 |
| Lakes Marion and Moultrie (P) | 89 | 71 | 69 | 87 | 1,862,000 |
| **SOUTH CAROLINA--GEORGIA** | | | | | |
| Clark Hill (FP) | 78 | 77 | 60 | 83 | 1,730,000 |
| **GEORGIA** | | | | | |
| Burton (PR) | 79 | 73 | 57 | 78 | 104,000 |
| Sinclair (MPR) | 97 | 91 | 82 | 97 | 214,000 |
| Lake Sidney Lanier (FMPR) | 64 | 63 | 52 | 64 | 1,686,000 |
| **ALABAMA** | | | | | |
| Lake Martin (P) | 88 | 73 | 68 | 95 | 1,375,000 |
| **TENNESSEE VALLEY** | | | | | |
| Clinch Projects: Norris and Melton Hill Lakes (FPR) | 36 | 34 | 35 | 32 | 2,229,300 |
| Douglas Lake (FPR) | 15 | 14 | 14 | 17 | 1,394,000 |
| Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR) | 48 | 43 | 42 | 54 | 1,012,000 |
| Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR) | 35 | 38 | 34 | 36 | 2,880,000 |
| Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR) | 46 | 46 | 40 | 51 | 1,478,000 |
| **WISCONSIN** | | | | | |
| Chippewa and Flambeau (PR) | 54 | 57 | 43 | 78 | 365,000 |
| Wisconsin River (21 reservoirs) (PR) | 52 | 66 | 34 | 80 | 399,000 |
| **MINNESOTA** | | | | | |
| Mississippi River headwater system (FMR) | 22 | 20 | 20 | 26 | 1,640,000 |
| **NORTH DAKOTA** | | | | | |
| Lake Sakakawea (Garrison) (FIPR) | 84 | 86 | 82 | 87 | 22,700,000 |
| **SOUTH DAKOTA** | | | | | |
| Angostura (I) | 77 | 89 | 74 | 75 | 127,600 |
| Belle Fourche (I) | 58 | 90 | 48 | 52 | 185,200 |
| Lake Francis Case (FIP) | 62 | 67 | 65 | 61 | 4,834,000 |
| Lake Oahe (FIP) | 86 | 82 | ... | 82 | 22,530,000 |
| Lake Sharpe (FIP) | 101 | 101 | 97 | 102 | 1,725,000 |
| Lewis and Clarke Lake (FIP) | 95 | 92 | 93 | 92 | 477,000 |
| **NEBRASKA** | | | | | |
| Lake McConaughy (IP) | 86 | 81 | 72 | 87 | 1,948,000 |
| **OKLAHOMA** | | | | | |
| Eufaula (FPR) | 82 | 89 | 82 | 80 | 2,378,000 |
| Keystone (FPR) | 82 | 79 | 86 | 78 | 661,000 |
| Tenkiller Ferry (FFR) | 92 | 104 | 89 | 90 | 628,200 |
| Lake Altus (FIMR) | 43 | 53 | 48 | 39 | 133,000 |
| Lake O'The Cherokees (FPR) | 90 | 93 | 78 | 87 | 1,492,000 |
| **OKLAHOMA--TEXAS** | | | | | |
| Lake Texoma (FMPRW) | 95 | 89 | 87 | 95 | 2,722,000 |
| **TEXAS** | | | | | |
| Bridgeport (IMW) | 75 | 85 | 45 | 76 | 386,400 |
| Canyon (FMR) | 89 | 94 | 77 | 88 | 385,600 |
| International Amistad (FIMPW) | 78 | 88 | 86 | 77 | 3,497,000 |
| International Falcon (FIMPW) | 43 | 72 | 77 | 46 | 2,668,000 |
| Livingston (IMW) | 101 | 101 | 85 | 101 | 1,788,000 |
| Possum Kingdom (IMPRW) | 83 | 88 | 95 | 90 | 570,200 |
| Red Bluff (PI) | 14 | 17 | 30 | 13 | 307,000 |
| Toledo Bend (P) | 89 | 91 | 83 | 91 | 4,472,000 |
| Twin Buttes (FIM) | 22 | 37 | 33 | 21 | 177,800 |
| Lake Kemp (IMW) | 104 | 84 | 85 | 102 | 268,000 |
| Lake Meredith (FWM) | 42 | 51 | 37 | 43 | 796,900 |
| Lake Travis (FIMPRW) | 80 | 79 | 80 | 79 | 1,144,000 |
| **MONTANA** | | | | | |
| Canyon Ferry (FIMPR) | 84 | 86 | 81 | 87 | 2,043,000 |
| Fort Peck (FPR) | 85 | 85 | 82 | 86 | 18,910,000 |
| Hungry Horse (FIPR) | 76 | 89 | 68 | 76 | 3,451,000 |
| **WASHINGTON** | | | | | |
| Ross (PR) | 81 | 66 | 54 | 71 | 1,052,000 |
| Franklin D. Roosevelt Lake (IP) | 102 | 101 | 82 | 88 | 5,022,000 |
| Lake Chelan (PR) | 57 | 45 | 45 | 57 | 676,100 |
| Lake Cushman (PR) | 44 | 47 | 82 | 48 | 359,500 |
| Lake Merwin (P) | 102 | 100 | 96 | 99 | 245,600 |
| **IDAHO** | | | | | |
| Boise River (4 reservoirs) (FIP) | 55 | 66 | 63 | 70 | 1,235,000 |
| Coeur d'Alene Lake (P) | 79 | 71 | 49 | 41 | 238,500 |
| Pend Oreille Lake (FP) | 66 | 83 | 54 | 58 | 1,561,000 |
| **IDAHO--WYOMING** | | | | | |
| Upper Snake River (8 reservoirs) (MP) | 69 | 70 | 66 | 51 | 4,401,000 |
| **WYOMING** | | | | | |
| Boysen (FIP) | 76 | 75 | 70 | 79 | 802,000 |
| Buffalo Bill (IP) | 76 | 83 | 64 | 78 | 421,300 |
| Keyhole (F) | 26 | 32 | 44 | 26 | 193,800 |
| Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I) | 75 | 57 | 47 | 73 | 3,056,000 |
| **COLORADO** | | | | | |
| John Martin (FIR) | 29 | 14 | 15 | 24 | 364,400 |
| Taylor Park (IR) | 58 | 66 | 55 | 60 | 106,200 |
| Colorado–Big Thompson project (I) | 84 | 56 | 55 | 83 | 722,600 |
| **COLORADO RIVER STORAGE PROJECT** | | | | | |
| Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR) | 87 | 88 | ... | 90 | 31,620,000 |
| **UTAH--IDAHO** | | | | | |
| Bear Lake (IPR) | 78 | 80 | 57 | 80 | 1,421,000 |
| **CALIFORNIA** | | | | | |
| Folsom (FIP) | 63 | 68 | 54 | 80 | 1,000,000 |
| Hetch Hetchy (MP) | 83 | 77 | 32 | 86 | 360,400 |
| Isabella (FIR) | 55 | 49 | 26 | 53 | 568,100 |
| Pine Flat (FI) | 67 | 61 | 52 | 77 | 1,001,000 |
| Clair Engle Lake (Lewiston) (P) | 82 | 85 | 76 | 87 | 2,438,000 |
| Lake Almanor (P) | 90 | 85 | 50 | 93 | 1,036,000 |
| Lake Berryessa (FIMW) | 100 | 102 | 83 | 104 | 1,600,000 |
| Millerton Lake (FI) | 80 | 76 | 65 | 83 | 503,200 |
| Shasta Lake (FIPR) | 77 | 85 | 71 | 78 | 4,377,000 |
| **CALIFORNIA--NEVADA** | | | | | |
| Lake Tahoe (IPR) | 76 | 87 | 50 | 87 | 744,600 |
| **NEVADA** | | | | | |
| Rye Patch (I) | 61 | 90 | 57 | 84 | 194,300 |
| **ARIZONA--NEVADA** | | | | | |
| Lake Mead and Lake Mohave (FIMP) | 93 | 92 | 68 | 94 | 27,970,000 |
| **ARIZONA** | | | | | |
| San Carlos (IP) | 86 | 16 | 18 | 86 | 1,073,000 |
| Salt and Verde River system (IMPR) | 85 | 79 | 42 | 82 | 2,019,100 |
| **NEW MEXICO** | | | | | |
| Conchas (FIR) | 68 | 73 | 80 | 68 | 330,100 |
| Elephant Butte and Caballo (FIPR) | 57 | 42 | 31 | 56 | 2,453,000 |

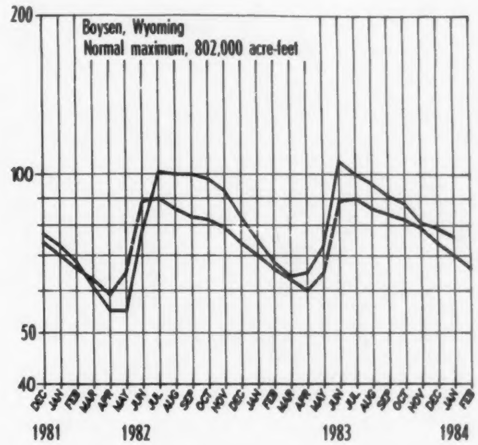
[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

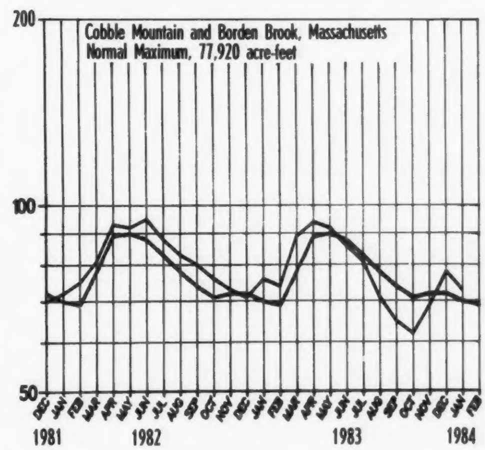
## USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS, DECEMBER 1981 TO JANUARY 1984

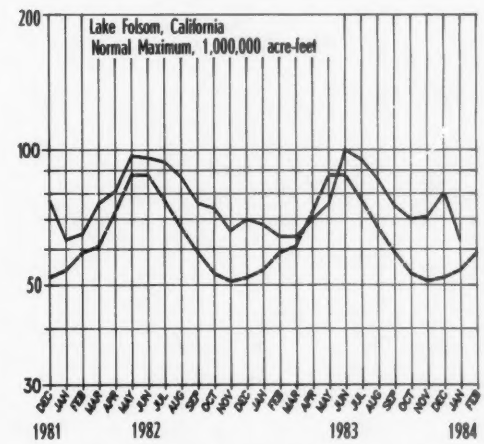
Dashed line indicates average of month-end contents. Solid line indicates current period.

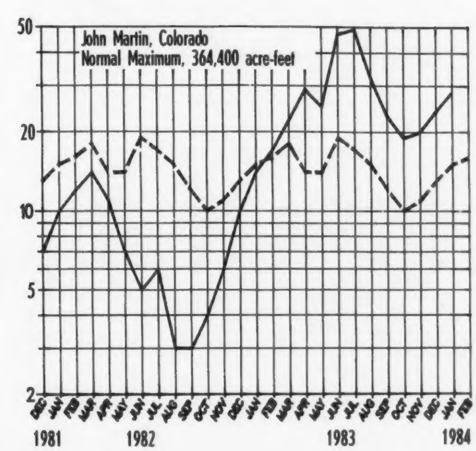
PERCENT OF NORMAL MAXIMUM

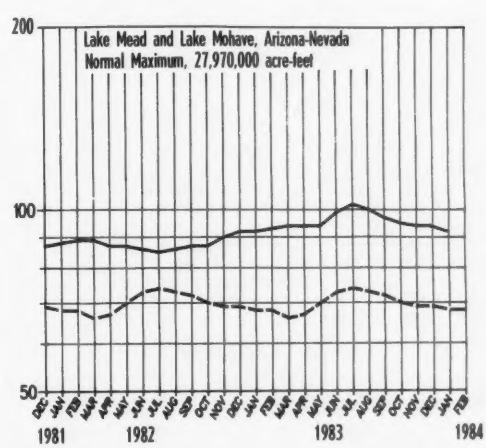


## *FLOW OF LARGE RIVERS DURING JANUARY 1984*

| Station number | Stream and place of determination | Drainage area (square miles) | Mean annual discharge through September 1980 (cubic feet per second) | January 1984 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Monthly mean discharge (cubic feet per second) | Percent of median monthly discharge, 1951–80 | Change in discharge from previous month (percent) | Discharge near end of month | | |
| | | | | | | | Cubic feet per second | Million gallons per day | Date |
| 01014000 | St. John River below Fish River at Fort Kent, Maine | 5,690 | 9,647 | 3,858 | 137 | -62 | 3,220 | 2,081 | 31 |
| 01318500 | Hudson River at Hadley, N.Y | 1,664 | 2,909 | 2,230 | 127 | -68 | 1,650 | 1,066 | 31 |
| 01357500 | Mohawk River at Cohoes, N.Y | 3,456 | 5,734 | 3,080 | 68 | -75 | 2,500 | 1,620 | 31 |
| 01463500 | Delaware River at Trenton, N.J | 6,780 | 11,750 | 8,068 | 77 | -71 | 6,150 | 3,974 | 31 |
| 01570500 | Susquehanna River at Harrisburg, Pa | 24,100 | 34,530 | 17,200 | 50 | -79 | 16,000 | 10,300 | 31 |
| 01646500 | Potomac River near Washington, D.C. | 11,560 | [1] 11,490 | 10,900 | 83 | -59 | 15,200 | 9,820 | 31 |
| 02105500 | Cape Fear River at William O. Huske Lock near Tarheel, N.C. | 4,810 | 5,005 | 12,000 | 163 | +20 | 6,700 | 4,330 | 31 |
| 02131000 | Pee Dee River at Peedee, S.C | 8,830 | 9,851 | 20,600 | 146 | +250 | 20,200 | 13,060 | 30 |
| 02226000 | Altamaha River at Doctortown, Ga | 13,600 | 13,880 | 26,760 | 164 | -2 | 63,000 | 40,700 | 31 |
| 02320500 | Suwannee River at Branford, Fla | 7,880 | 6,987 | 11,800 | 235 | +76 | 11,900 | 7,690 | 31 |
| 02358000 | Apalachicola River at Chattahoochee, Fla | 17,200 | 22,570 | 41,900 | 145 | -12 | 65,800 | 42,530 | 30 |
| 02467000 | Tombigbee River at Demopolis lock and dam near Coatopa, Ala | 15,400 | 23,300 | 51,229 | 137 | -44 | 30,400 | 19,650 | 31 |
| 02489500 | Pearl River near Bogalusa, La | 6,630 | 9,768 | 18,800 | 192 | -5 | 16,200 | 10,470 | 31 |
| 03049500 | Allegheny River at Natrona, Pa | 11,410 | [1] 19,480 | 10,770 | 48 | -73 | 9,200 | 5,950 | 25 |
| 03085000 | Monongahela River at Braddock, Pa. | 7,337 | [1] 12,510 | 6,871 | 36 | -66 | 9,000 | 5,800 | 26 |
| 03193000 | Kanawha River at Kanawha Falls, W. Va | 8,367 | 12,590 | 9,718 | 61 | -51 | 14,900 | 9,630 | 26 |
| 03234500 | Scioto River at Higby, Ohio | 5,131 | 4,547 | 2,073 | 37 | -74 | 4,080 | 2,636 | 30 |
| 03294500 | Ohio River at Louisville, Ky[2] | 91,170 | 116,000 | 88,840 | 58 | -51 | 127,000 | 82,100 | 31 |
| 03377500 | Wabash River at Mount Carmel, Ill | 28,635 | 27,220 | 17,200 | 67 | -68 | 17,000 | 11,000 | 30 |
| 03469000 | French Broad River below Douglas Dam, Tenn | 4,543 | 6,798 | 6,286 | 73 | -43 | ..... | ..... | ... |
| 04084500 | Fox River at Rapide Croche Dam, near Wrightstown, Wis[2] | 6,150 | 4,163 | 4,322 | 119 | +6 | 5,225 | 3,363 | 26 |
| 04264331 | St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3] | 299,000 | 242,700 | 238,100 | 104 | -10 | 260,000 | 168,000 | 31 |
| 05011500 | St. Maurice River at Grand Mere, Quebec | 16,300 | 25,150 | 6,130 | 83 | -36 | 17,800 | 11,500 | 31 |
| 05082500 | Red River of the North at Grand Forks, N. Dak | 30,100 | 2,551 | 1,632 | 147 | -18 | 1,600 | 1,030 | 30 |
| 05133500 | Rainy River at Manitou Rapids, Minn. | 19,400 | 12,830 | 12,000 | 124 | -18 | 11,000 | 7,100 | 23 |
| 05330000 | Minnesota River near Jordan, Minn. | 16,200 | 3,402 | 1,398 | 288 | -39 | 1,230 | 794 | 31 |
| 05331000 | Mississippi River at St. Paul, Minn | 36,800 | [1] 10,610 | 8,788 | 182 | -19 | 7,700 | 4,980 | 31 |
| 05365500 | Chippewa River at Chippewa Falls, Wis. | 5,600 | 5,100 | 4,350 | 145 | -20 | 3,500 | 2,260 | 30 |
| 05407000 | Wisconsin River at Muscoda, Wis | 10,300 | 8,617 | 8,126 | 135 | -32 | 6,811 | 4,402 | 31 |
| 05446500 | Rock River near Joslin, Ill | 9,551 | 5,873 | 4,570 | 125 | -37 | 4,010 | 2,591 | 31 |
| 05474500 | Mississippi River at Keokuk, Iowa | 119,000 | 62,620 | 56,200 | 163 | -24 | 46,300 | 29,920 | 31 |
| 06214500 | Yellowstone River at Billings, Mont | 11,796 | 7,038 | 3,740 | 149 | +24 | 4,300 | 2,780 | 30 |
| 06934500 | Missouri River at Hermann, Mo | 524,200 | 79,490 | 50,290 | 151 | -40 | 47,600 | 30,760 | 31 |
| 07289000 | Mississippi River at Vicksburg, Miss[4] | 1,140,500 | 576,600 | 560,000 | 87 | -43 | 490,000 | 317,000 | 28 |
| 07331000 | Washita River near Dickson, Okla. | 7,202 | 1,368 | 894 | 248 | +23 | 858 | 554 | 25 |
| 08276500 | Rio Grande below Taos Junction Bridge, near Taos, N. Mex | 9,730 | 725 | 443 | 106 | -6 | 480 | 310 | 31 |
| 09315000 | Green River at Green River, Utah. | 40,600 | 6,298 | 5,040 | 201 | -15 | 5,650 | 3,651 | 24 |
| 11425500 | Sacramento River at Verona, Calif | 21,257 | 18,820 | 49,364 | 175 | -23 | ..... | ..... | ... |
| 13269000 | Snake River at Weiser, Idaho | 69,200 | 18,050 | 33,700 | 205 | +25 | 34,600 | 22,360 | 28 |
| 13317000 | Salmon River at White Bird, Idaho | 13,550 | 11,250 | 5,800 | 136 | -9 | 7,200 | 4,650 | 26 |
| 13342500 | Clearwater River at Spalding, Idaho | 9,570 | 15,480 | 10,900 | 153 | +104 | 12,700 | 8,210 | 28 |
| 14105700 | Columbia River at The Dalles, Oreg[5] | 237,000 | 193,100 | 146,800 | 170 | +55 | 193,000 | 124,700 | 30 |
| 14191000 | Willamette River at Salem, Oreg. | 7,280 | 23,510 | 40,200 | 70 | -22 | 31,200 | 20,170 | 30 |
| 15515500 | Tanana River at Nenana, Alaska. | 25,600 | 23,460 | 5,994 | 92 | -11 | 5,800 | 3,750 | 31 |
| 8MF005 | Fraser River at Hope, British Columbia. | 83,800 | 96,290 | 34,992 | 99 | +5 | 37,429 | 24,190 | 30 |

[1] Adjusted.
[2] Records furnished by Corps of Engineers.
[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

## *DISSOLVED SOLIDS AND WATER TEMPERATURES FOR JAN*

| Station number | Station name | January data of following calendar years | Stream discharge during month | Dissolved-s dur |
|---|---|---|---|---|
| | | | Mean (cfs) | Minimum (mg/L) |
| | *NORTHEAST* | | | |
| 01463500 | Delaware River at Trenton, N.J. (Morrisville, Pa.) | 1984 | 8,070 | 91 |
| | | 1945–83 | 13,100 | 62 |
| | | (Extreme yr) | | (1951, 60) |
| | | | [c]10,440 | |
| 04264331 | St. Lawrence River at Cornwall, Ontario, near Massena, N.Y. median streamflow at Ogdensburg, N.Y. | 1984 | 236,000 | 167 |
| | | 1976–83 | 237,800 | 165 |
| | | (Extreme yr) | | (1981, 83) |
| | | | [c]228,900 | |
| | *SOUTHEAST* | | | |
| 0728900 | Mississippi River at Vicksburg, Miss. | 1984 | 560,000 | 198 |
| | | 1976–83 | 626,100 | 157 |
| | | (Extreme yr) | | (1979) |
| | | | [c]645,700 | |
| | *WESTERN GREAT LAKES REGION* | | | |
| 03612500 | Ohio River at lock and dam 53, near Grand Chain, Ill. (25 miles west of Paducah, Ky.; streamflow station at Metropolis, Ill.) | 1984 | 288,000 | 190 |
| | | 1955–83 | 365,000 | 98 |
| | | (Extreme yr) | | (1973) |
| | | | [c]362,300 | |
| | *MIDCONTINENT* | | | |
| 06934500 | Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.) | 1984 | 50,300 | 436 |
| | | 1976–83 | 39,520 | 159 |
| | | (Extreme yr) | | (1976) |
| | | | [c]33,290 | |
| | *WEST* | | | |
| 14128910 | Columbia River at Warrendale, Oreg. (streamflow station at The Dalles, Oreg.) | 1984 | 193,000 | 103 |
| | | 1976–83 | 173,800 | 76 |
| | | (Extreme yr) | | (1978) |
| | | | [c]86,480 | |

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of r
[b]To convert °C to °F: $[(1.8 \times °C) + 32] = °F$.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comp

Provisional data; subject to revision

## ...ANUARY 1984 AT DOWNSTREAM SITES ON SIX LARGE RIVERS

| ...ed-solids concentration during month[a] | | Dissolved-solids discharge during month[a] | | | Water temperature during month[b] | | |
|---|---|---|---|---|---|---|---|
| ...um (...L) | Maximum (mg/L) | Mean (tons per day) | Minimum (tons per day) | Maximum (tons per day) | Mean in°C | Mini- mum, in°C | Maxi- mum, in°C |
| | 139 | 2,320 | 1,710 | 3,770 | 1.0 | 0 | 2.5 |
| | 201 | ..... | 758 | 20,800 | ... | 0 | 7.5 |
| ...60) | (1959) | | (1981) | (1976) | | | |
| | 167 | 106,000 | 99,000 | 113,000 | 0.5 | 0.5 | 1.0 |
| | 168 | 107,000 | 90,000 | 139,000 | 0.5 | 0 | 4.0 |
| ...83) | (1976, 77, 79, 80) | | (1977, 79) | (1980, 82) | | | |
| ...3 | 253 | 335,000 | 293,000 | 396,000 | 2.0 | 0.5 | 3.5 |
| ... | 299 | 302,000 | 128,000 | 501,000 | 4.0 | 0 | 9.0 |
| ...9) | (1981) | | (1981) | (1978) | | | |
| ...) | 272 | ..... | 63,100 | 202,000 | ... | 0.5 | 4.0 |
| ...3 | 382 | ..... | 28,500 | 448,000 | ... | 0 | 10.0 |
| ...3) | (1964) | | (1956) | (1970) | | | |
| ...6 | 518 | 64,600 | 34,000 | 86,300 | 2.0 | 0 | 5.0 |
| ...9 | 553 | 45,000 | 18,100 | 159,000 | 1.5 | 0 | 5.5 |
| ...6) | (1977) | | (1981) | (1982) | | | |
| ...3 | 124 | 59,600 | 35,000 | 79,800 | 3.0 | 2.0 | 4.0 |
| ...6 | 125 | 47,800 | 24,300 | 78,400 | 4.0 | 0 | 9.0 |
| ...78) | (1983) | | (1979) | (1981) | | | |

...s of measurements of specific conductance.

...comparison with data for current month.

The text and figure below are from the report, *National water summary 1983—Hydrologic events and issues*, U.S. Geological Survey Water-Supply Paper 2250, 243 pages (1984), released on January 22, 1984. This report may be purchased for $9.00 from Branch of Distribution, Text Products Section, U.S. Geological Survey, 604 S. Pickett St., Alexandria, VA 22304 (check or money order payable to U.S. Geological Survey); or from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 (payable to Superintendent of Documents).

### Extract from INTRODUCTION

Periodic analysis of national water conditions and identification of water issues can help to identify deficiencies in water-related information and can serve as the first step in developing water-policy options. Consequently, the purpose of this report and subsequent National Water Summary reports is to describe and analyze the condition of the Nation's water. The Geological Survey's National Water Summary reports will not propose or recommend water policies. However, these reports will summarize the results of recent analyses of water-related information for use by those groups that do formulate policies.

This report is organized in four parts, each of which is independent but related to the other parts. The four parts are:

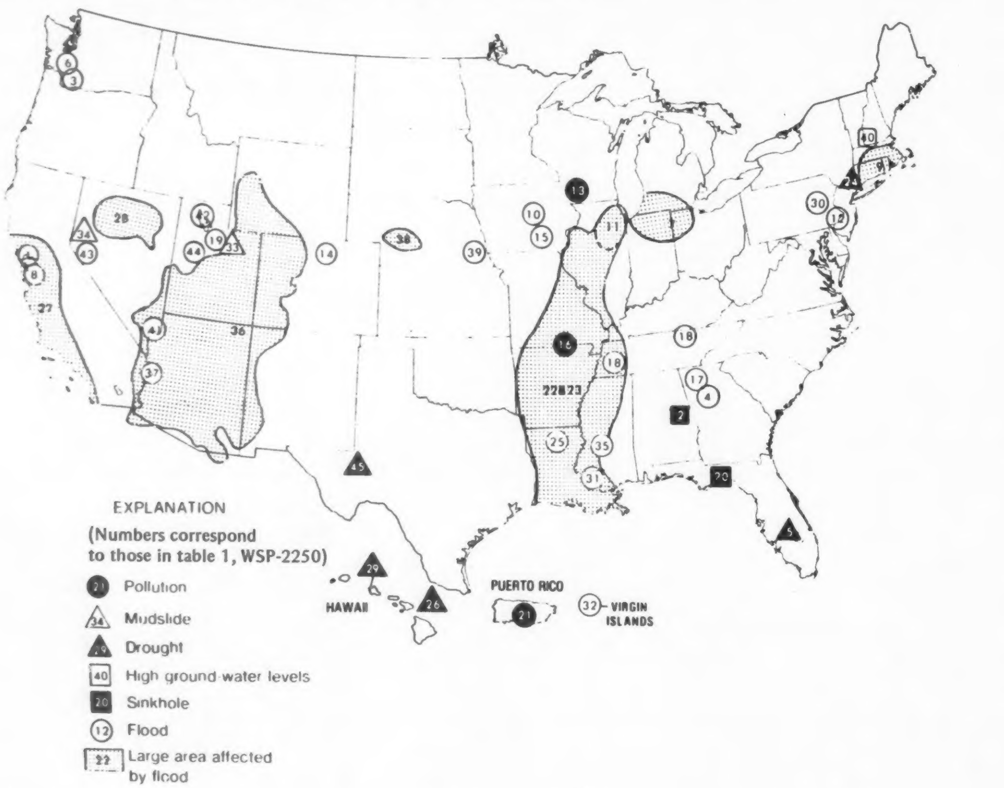
**Man and the hydrologic cycle**, which provides an over-view of hydrologic processes and man's interaction with those processes, particularly in such areas as water supply, agriculture, and urbanization.

**Selected hydrologic events for January 1982 through August 1983**, which provides a synopsis of the hydrologic events that occurred during that period. This part covers rapidly changing water-resources conditions, as distinct from long-term or gradually evolving conditions and issues. It provides background for many of the water-availability and hydrologic hazard issues discussed in subsequent parts.

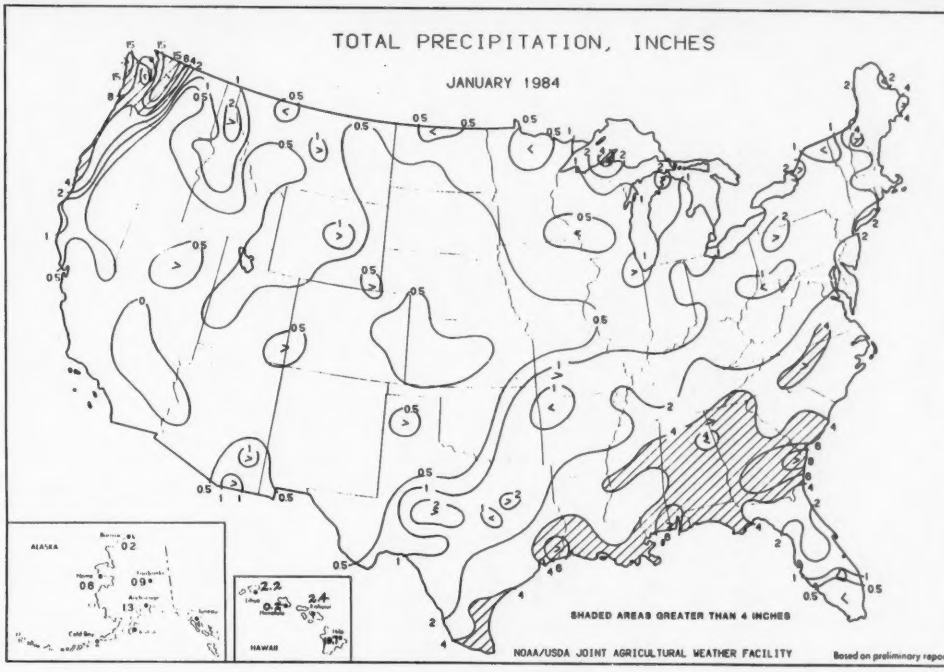
**Hydrologic perspectives on water issues**, which provides background information and a hydrologic perspective for most of the issues described in the individual State summaries of water issues. Extensive references to current studies and additional information sources also are included.

**State water issues**, which summarizes the water issues of concern for each State, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and western Pacific Islands under United States jurisdiction. These issues are grouped in four categories: water availability, water quality, hydrologic hazards and land use, and institutional and management. Each State summary includes a map that shows the location of areas affected by or involved in specific issues, a summary table of water-use data, and a list of selected references.

The State water issues described in this report are the result of consultations between U.S. Geological Survey personnel in each State and more than 130 State and local organizations concerned with water, from May through July 1983. Many of these organizations cooperate with the U.S. Geological Survey in water-resources investigations. The U.S. Department of the Interior's Office of Water Policy also cooperated in the activity by arranging for representatives of the Governors to review the issues relating to their States.




Significant hydrologic events in the conterminous United States, Hawaii, Puerto Rico, and the U.S. Virgin Islands, January 1982–August 1983.




(From Weekly Weather and Crop Bulletin published by National Weather Service and Department of Agriculture.)

## NATIONAL WATER CONDITIONS

**January 1984**

Based on reports from the Canadian and U.S. Field offices; completed February 9, 1984

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EXPLANATION OF DATA

*Cover map* shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile). Shorter reference periods are used for the Puerto Rico index stations because of the limited records available.

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for January are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.



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